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(54) Apparatus for cooling liquids

(57) Apparatus for cooling liquids, e.g. beer, transported by pipelines (13) comprises a heat exchanger unit (21) confining volatile fluid having a liquid phase (22) and a vapour phase (23). Product coils (27) immersed in liquid phase (22) connect the pipelines (13) with stations for beer barrels and dispense taps. The lengths of pipelines (13) are housed in common in a thermally insulating sleeve (18) which includes a chilled water circuit (19) operated by a recirculating pump (20) and cooled by a secondary coil (28) immersed in the liquid body (22) of unit (21). Unit (21) also includes a refrigerant coil (24) in the vapour and connected via pipes (25) to a refrigeration unit (30). A cellar cooler unit may be provided connected in parallel with the heat exchanger unit (Figs. 3, 4).

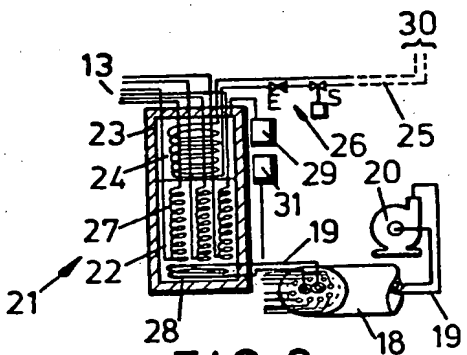

FIG. 2

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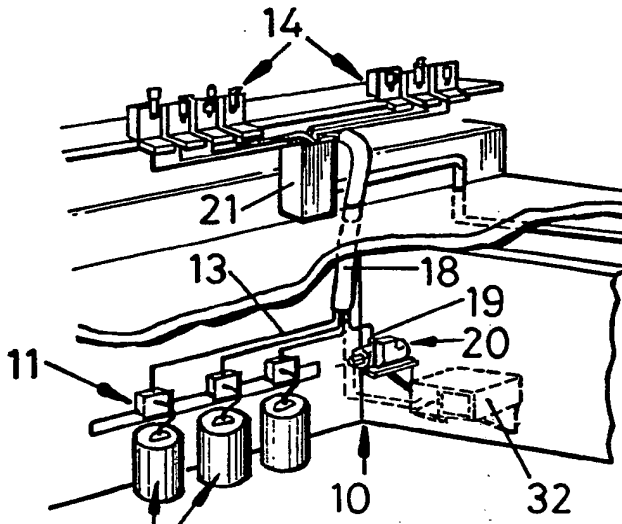

FIG 1

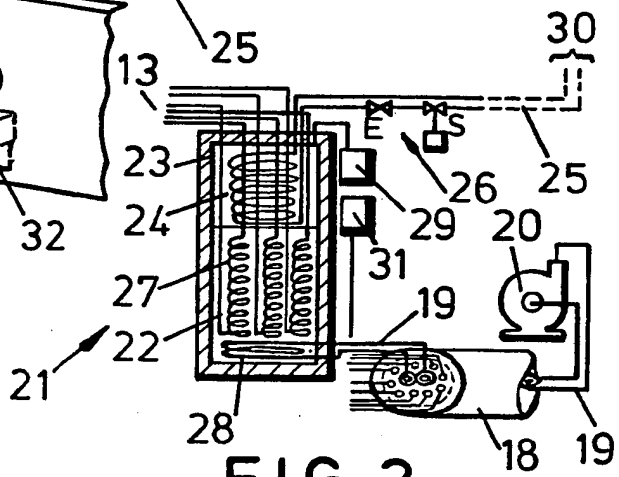

FIG. 2

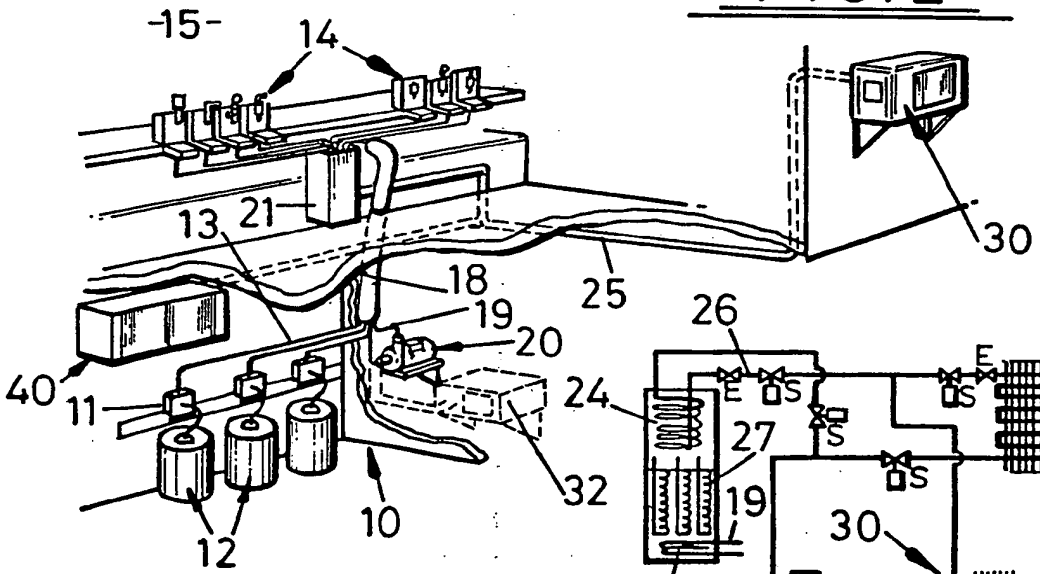

FIG. 3

FIG. 4

SPECIFICATION

Apparatus for cooling liquids

This invention relates to apparatus for cooling liquids which are transported along a pipeline.

According to the present invention there is provided apparatus for cooling liquids which are transported along pipelines, said apparatus comprising a heat exchanger unit confining a volatile fluid having liquid and vapour phases co-existing during operation of the heat exchanger and respectively forming a liquid body and a vapour body, a plurality of product coils each immersed in said liquid body connectable to respective pipelines along which liquids to be cooled are transported, said pipelines connecting said product coils to respective sources of liquid via pipeline lengths housed in common in a thermally insulating sleeve, said sleeve further including a chilled water circuit which circuit is connected to a secondary coil immersed in said liquid body of the heat exchanger unit. said heat exchanger unit including a refrigerant coil in said vapour body and connected to a refrigeration system.

Embodiments of the present invention will now be described by way of example with reference to the accompanying drawing in which:

Figure 1 illustrates apparatus according to the present invention;

Figure 2 schematically illustrates a detail of the Fig. 1 apparatus;

Figure 3 shows a modified form of the Fig. 1 apparatus; and

Figure 4 schematically illustrates a detail of the Fig. 3 apparatus.

As is illustrated in Figs. 1 and 2 of the attached drawing in order to dispense potable products such as beer or lager a cellar area 10 is provided with stations 11 for beer barrels 12 which provide respective sources of liquid beer to be cooled and to be transported along pipelines 13 for dispense at respective beer taps 14 in a remote bar area 15. The pipelines 13 for the majority of their lengths are encased in a thermally insulating sleeve 18 known as a "Python" which may be made of foam rubber, for example, and the Python includes throughout its length flow and return conduits 19 containing chilled water which is circulated within the conduits 19 by a chilled water re-circulation pump 20. In the vicinity of the dispense taps 14 at the bar area 15 the Python is connected to a heat exchanger unit 21 which provides the principal source of cooling for the chilled water in the conduits 19 and for the beer in the pipelines 13. The heat exchanger unit 21 which is shown in more detail in Fig. 2, incorporates a conventional refrigerant fluid such as R12 which within the unit 21 forms a liquid body 22 and a vapour body 23 and within the vapour body there is a refrigerant coil 24 which is connected to a remote refrigeration unit 30 (Fig. 1) via lines 25 containing expansion and solenoid valves 26.

Within the heat exchanger unit 21 the beer lines 13 are connected to product coils 27 immersed in the liquid body 22 and the chilled water conduits 19 terminate in a secondary coil 28 also immersed in the liquid body 22. Operation of the heat exchanger unit 21 is controlled by a pressure switch 29 connected to the portion of the unit 21 containing the vapour body 23 and which operates the refrigeration system solenoid valve 26.

A thermostat 31 couples to the chilled water conduits 19 senses the temperature of the returned water and controls operation of the recirculation pump 20. In order to increase the capacity of the chilled water system a separate water chill unit 32 (Fig. 1) may be provided in the vicinity of the re-circulation pump 20.

In the modification illustrated in Figs. 3 and 4 of the drawing the atmosphere of the cellar area 10 is conditioned by a cellar cooler unit 40 to maintain a prdetermined ambient temperature such as 54°F, and this cooler unit 40 is connected in parallel with the heat exchanger unit 21 to the refrigeration system 30 via expansion (E) and solenoid valves (s). Conventionally such cellar cooler units 40 are designed for about 75% operation at maximum heat load so that in general a substantial amount of the installed capacity of the cellar cooler unit 40 is not utilised. When the cellar cooler unit 40 is connected as shown in Fig. 4 this un-utilised capacity can be utilised, without detrimental effect to the cellar cooler unit 40, to service the heat exchanger unit 21.

It will be appreciated that as previously described the heat exchanger unit 21 is located in the bar area 15 so that the cooling function is undertaken adjacent the point of dispense of the beer which improves control over the dispense temperature.

CLAIMS

1. Apparatus for cooling liquids which are transported along pipelines, said apparatus comprising a heat exchanger unit confining a volatile fluid having liquid and vapour phases co-existing during operation of the heat exchanger and respectively forming a liquid body and a vapour body, a plurality of product coils each immersed in said liquid body connectable to respective pipelines along which liquids to be cooled are transported, said pipelines connecting said product coils to respective sources of liquid via pipeline lengths housed in common in a thermally insulating sleeve, said sleeve further including a chilled water circuit which circuit is connected to a secondary coil immersed in said liquid body of the heat exchanger unit, said heat exchanger unit including a refrigerant coil in said vapour body and connected to a refrigeration system.

2. Apparatus as claimed in claim 1, and substantially as hereinbefore described with reference to Figs. 1 and 2 of the accompanying drawing.

3. Apparatus as claimed in claim 1, and substantially as hereinbefore described with reference to Figs. 3 and 4 of the accompanying drawing.

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